REMARKS

The foregoing amendments are responsive to the June 16, 2005 Final Office Action. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Response to Request for Information

The Examiner requested a copy of the "SuperNEC: Parallel MOM USER Reference Manual," Version 1.00, Poynting Software Ltd., September 21, 1999. A copy of the requested document is provided herewith in connection with an Information Disclosure Statement.

Objection to the Specification

Applicant has amended typographical errors identified by the Examiner on pages 8 and 9 of the specification. These amendments correct typographical errors and do not add new matter.

Response to Rejection of Claims 1-33 Under 35 U.S.C. 102(b)

The Examiner rejected Claims 1-33 under 35 US.C. 102(b) as being anticipated by *Rockwell*. Specifically, the Examiner argues that a composite source or tester could be a linear combination of one original source or one original tester and thus not distinguishable from the original source or tester. Applicant has amended the claims to clarify that at least one of the composite sources or testers is a combination of two or more original sources or testers.

Rockwell teaches using a known prior-art technique of employing a single SVD rank reduction on a rectangular array of data to compress the array. It was known previously that composite sources and composite testers that are created by a single SVD applied to a given rectangular array of data can then be used to compress that same array of data.

The present application teaches that one can use a first rank reduction on a first set of data to obtain composite sources, and a second rank reduction on a second (and different) set of data to obtain composite testers, and then use these separately-computed composite sources and composite testers together to compress a third set of data. The third set of data is not identical to at least one of the first and second sets of data.

For example, the first set of data may be a matrix describing the far-field effect of each source at various angles and the second set of data may be a different matrix describing the reception of each tester from various angles. In this example, the first and second data are obtained separately from physical principles rather than applications of linear algebra and thus, it is not obvious that rank reductions of the first and second matrices could be used to compress a third matrix.

Regarding Claim 1, *Rockwell* does not teach or suggest partitioning a first set of basis functions into groups, each group corresponding to a region, each basis function corresponding to one unknown in a system of linear equations, each of the basis functions corresponding to an original source, selecting a plurality of spherical angles, using a computer system, calculating a far-field disturbance produced by each of the basis functions in a first group for each of the spherical angles to produce a matrix of transmitted disturbances, reducing a rank of the matrix of transmitted disturbances to yield a second set of basis functions, the second set of basis functions corresponding to composite sources, each of the composite sources comprising a linear combination of N of the original basis functions, partitioning a first set of weighting functions into groups, each group corresponding to one of the regions, each weighting function corresponding to a condition, each of the weighting functions corresponding to an original tester, using a computer system, calculating a far-field disturbance received by each of the testers in a first group for each of the spherical angles to produce a matrix of received disturbances, reducing a rank of the matrix of received disturbances to yield a second set of weighting functions, the second set of weighting functions corresponding to composite testers, each of the composite testers comprising a linear combination of M of the original testers, wherein at least one of M or N is greater than one, and transforming the system of linear equations to use the composite sources and the composite testers.

Regarding Claim 2, *Rockwell* does not teach or suggest partitioning a first set of basis functions into groups, each group corresponding to a region, each basis function corresponding to an unknown in a system of equations, each of the basis functions corresponding to an original source, selecting a first plurality of angular directions, calculating a disturbance produced by each of the basis functions in a first group for each of the angular directions to produce a matrix of disturbances, using the matrix of disturbances to compute a second set of basis functions, the second set of basis functions corresponding to composite sources, wherein at least one of the

composite sources produces a relatively weak disturbance from a portion of space around the at least one composite source, partitioning a first set of weighting functions into groups, each group corresponding one of the regions, each weighting function corresponding to a condition, each of the weighting functions corresponding to an original tester, calculating a disturbance received by each of the testers in a second plurality of angular directions to produce a matrix of received disturbances, using the matrix of received disturbances to compute a second set of weighting functions, the second set of weighting functions corresponding to composite testers, wherein at least one of the composite testers weakly receives disturbances from a portion of space relative to the at least one composite tester, and transforming at least a portion of the system of equations to use one or more of the composite sources and one or more of the composite testers.

Regarding Claim 3, *Rockwell* does not teach or suggest the method of Claim 2, wherein the matrix of disturbances is a moment method matrix.

Regarding Claim 4, *Rockwell* does not teach or suggest that using the matrix of disturbances from Claim 2 to compute a second set of basis functions comprises reducing a rank of the matrix of disturbances.

Regarding Claim 5, *Rockwell* does not teach or suggest that using the matrix of received disturbances from Claim 2 to compute a second set of weighting functions comprises reducing a rank of the matrix of received disturbances.

Regarding Claim 6, *Rockwell* does not teach or suggest that the disturbance of Claim 2 is at least one of an electromagnetic field, a heat flux, an electric field, a magnetic field, a vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, a strong nuclear force, and a gravity force.

Regarding Claim 7, *Rockwell* does not teach or suggest that first plurality of directions in Claim 2 is substantially the same as the second plurality of directions.

Regarding Claim 8, *Rockwell* does not teach or suggest that the regions of space around the at least one composite source in Claim 2 are far-field regions.

Regarding Claim 9, *Rockwell* does not teach or suggest that the at least a portion of a region around the at least one composite tester in Claim 2 is a far-field region.

Regarding Claim 10, *Rockwell* does not teach or suggest calculating one or more composite sources as a linear combination of M basis functions, wherein at least one of the composite sources produces a relatively weak disturbance in a portion of space related to the at

least one composite source, calculating one or more composite testers as a linear combination of N weighting functions, wherein at least one of the composite testers is affected relatively weakly by disturbances propagating from a portion of space around the at least one composite tester, where at least one of N or M is not one, and transforming at least a portion of a first system of equations based on the basis functions and the weighting functions into a second system of equations based on the composite sources and the composite testers.

Regarding Claim 11, *Rockwell* does not teach or suggest the method of Claim 10, wherein the disturbance is at least one of, an electromagnetic field, a heat flux, an electric field, a magnetic field, vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, strong nuclear force, and a gravity force.

Regarding Claim 12, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise electric currents.

Regarding Claim 13, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise magnetic currents.

Regarding Claim 14, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise acoustic sources.

Regarding Claim 15, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise electromagnetic sources.

Regarding Claim 16, *Rockwell* does not teach or suggest the method of Claim 10, wherein the composite sources comprise thermal sources.

Regarding Claim 17, *Rockwell* does not teach or suggest the method of Claim 10, wherein each of the composite sources corresponds to a region.

Regarding Claim 18, *Rockwell* does not teach or suggest the method of Claim 10, wherein the second system of equations is described by a sparse block diagonal matrix.

Regarding Claim 19, *Rockwell* does not teach or suggest the method of Claim 18, further comprising the step of reordering the sparse block diagonal matrix to shift relatively larger entries in the matrix towards a desired corner of the matrix.

Regarding Claim 20, *Rockwell* does not teach or suggest the method of Claim 10, further comprising the step of solving the second system of equations.

Regarding Claim 21, *Rockwell* does not teach or suggest the method of Claim 10, further comprising the step of solving the second system of equations to produce a first solution vector, the first solution vector expressed in terms of the composite testers.

Regarding Claim 22, *Rockwell* does not teach or suggest the method of Claim 21, further comprising the step of transforming the first solution vector into a second solution vector, the second solution vector expressed in terms of the weighting functions.

Regarding Claim 23, *Rockwell* does not teach or suggest calculating at least one composite source, the composite source representing a combination of N energy sources, using a computer system, calculating at least one composite tester as a combination of M testers, where at least one of N or M is greater than one, the at least one composite tester testing an effect produced by the at least one composite source, the at least one composite source interacting relatively weakly with the a t least one composite tester, and transforming at least a portion of a first system of linear equations into a second system of linear equations based at least on the at least one composite source and the at least one composite tester.

Regarding Claim 24, *Rockwell* does not teach or suggest the method of Claim 23, wherein the at least one composite source represents a linear combination of one or more energy sources such that the at least one composite source radiates relatively little energy into a portion of angular region disposed about the at least one source.

Regarding Claim 25, *Rockwell* does not teach or suggest the method of Claim 23, wherein the at least one composite tester is affected relatively weakly by energy propagating from a portion of space around the at least one composite tester.

Regarding Claim 26, *Rockwell* does not teach or suggest the method of Claim 23, wherein the second system of linear equations is represented by a block sparse matrix.

Regarding Claim 27, *Rockwell* does not teach or suggest means for calculating at least one composite source by combining N sources, means for calculating at least one composite tester by combining M testers, where at least N or M is greater than one, and means for transforming at least a portion of a first system of equations into a second system of equations based at least on the at least one composite source and the at least one composite tester the at least one composite tester testing an effect produced by the at least one composite source, the at least one composite source interacting relatively weakly with the a t least one composite tester.

Regarding Claim 28, *Rockwell* does not teach or suggest calculating a group of N composite sources as a combination of one or more basis functions, wherein at least one of the composite sources produces a relatively weak product in a portion of space, using a computer system, calculating one or more composite testers as a combination of a group of M weighting functions, wherein at least one of the composite testers interacts relatively weakly with the at least one composite tester and wherein either N or M is greater than one, and transforming at least a portion of a first array of interaction data based on the basis functions and the weighting functions into a second array of interaction data based on the composite sources and the composite testers.

Regarding Claim 29, *Rockwell* does not teach or suggest the method of Claim 28, wherein the disturbance is at least one of, an electromagnetic field, a heat flux, an electric field, a magnetic field, vector potential, a pressure, a sound wave, a particle flux, a weak nuclear force, strong nuclear force, a gravity force, and an image element.

Regarding Claim 30, *Rockwell* does not teach or suggest the method of Claim 28, wherein each of the composite sources corresponds to a region.

Regarding Claim 31, *Rockwell* does not teach or suggest the method of Claim 28, wherein the second array of interaction data is described by a sparse block diagonal matrix.

Regarding Claim 32, *Rockwell* does not teach or suggest the method of Claim 28, further comprising the step of using the second array of interaction data to compute a first solution vector, the first solution vector expressed in terms of the composite testers.

Regarding Claim 33, *Rockwell* does not teach or suggest the method of Claim 32, further comprising the step of transforming the first solution vector into a second solution vector, the second solution vector expressed in terms of the weighting functions.

Accordingly, Applicant asserts that Claims 1-33 are in condition for allowance, and Applicant requests allowance of Claims 1-33.

New Dependent Claims 34-51

Applicant has added additional dependent claims 34-51. Claims 34-41 depend (directly or indirectly) from Claim 1. Claims 42-49 depend (directly or indirectly) from Claim 2. Claims 50 and 51 depend (directly or indirectly) from Claim 10. Claims 34-51 recite features and aspects fully supported by the specification and do not add any new matter.

Applicant asserts that Claims 34-51 are allowable over the prior art, and Applicants request allowance of Claims 34-51.

Summary

Applicants respectfully assert that Claims 1-51 are in condition for allowance, and Applicants request allowance of Claims 1-51. If there are any remaining issues that can be resolved by a telephone conference, the Examiner is invited to call the undersigned attorney at (949) 721-6305 or at the number listed below.

Respectfully submitted,

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